



A powerful and highly integrated solution for particle analysis, flow cytometry and microscopy applications.

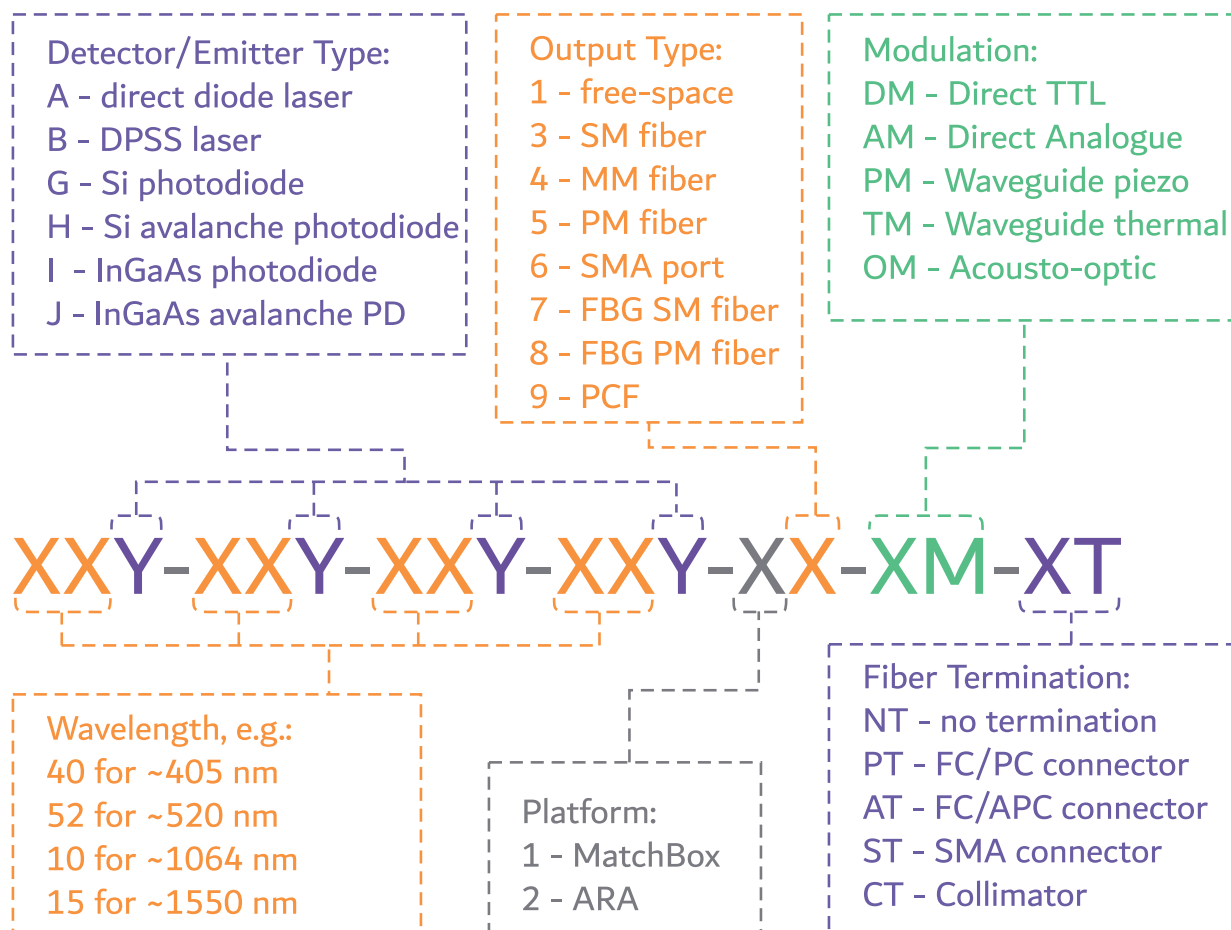
The housing includes 4 emitters/detectors, a dichroic combiner, 4-channel smart digital electronics with individual control and modulation, as well as TEC cooling. High-end stability and flexibility in a size of a MatchBox.

ADVANTAGES

- 4 slots for detectors/emitters
- Free-space or multi-mode fiber output
- Color mixing
- Fast warm-up time (bi-directional TEC)
- Compatible with MatchBox accessories



PART NUMBERS OF COMBINERS



SPECIFICATIONS

Part No.	Wave-length Set	Output Power (free-space '11')	Output Power (MM fiber '14')	Wave-length tolerance	8 hrs power stability (% RMS, 8 hrs)	Spectral line-width, nm
40A-45A- 52A-64A...	405 nm ● 450 nm ● 520 nm ● 638 nm ●	≤ 130 mW ≤ 70 mW ≤ 40 mW ≤ 130 mW	≤ 100 mW ≤ 30 mW ≤ 30 mW ≤ 100 mW	+/-3 nm +/-4 nm +/-4 nm +/-3 nm	<1	<1.5
40A-49A- 52A-64A...	405 nm ● 488 nm ● 520 nm ● 638 nm ●	≤ 130 mW ≤ 40 mW ≤ 40 mW ≤ 130 mW	≤ 100 mW ≤ 25 mW ≤ 30 mW ≤ 100 mW	+/-3 nm +/-4 nm +/-4 nm +/-3 nm		
Other wavelengths on request: 660 nm, 785 nm, 830 nm, 850 nm						

Based on the item code structure there are **thousands of different configurations**, which are theoretically possible. You are welcome to contact our sales staff in order to get a preliminary evaluation if your target configuration is potentially feasible in the MatchBox combiner platform.

Communication protocol

MatchBox series lasers (2nd edition) feature a Universal Asynchronous Receiver/Transmitter (UART) controller interface. The pinout of MatchBox Combiner is an expanded version of standard MB2 pin-out. The lower row of pins is the same as for single-wavelength lasers, while the second (upper) row is added for individual TTL modulation of each laser diode installed in the combiner.

Breakout Box

A 'breakout box' is used for converting UART into USB or RS232 protocols. The converter chip for USB is 'Silicon Labs CP2102' and for the RS232 it is 'MAX232'. Additionally, the breakout box of MatchBox combiner is equipped with necessary circuit for communication with QC2.0 and QC3.0 power supplies.

Pins for Tight Integration

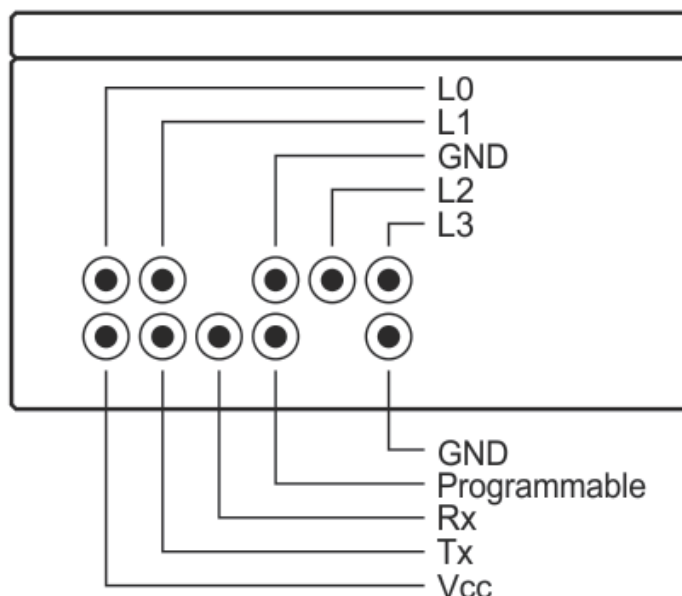


10 pins at the back of the laser combiner provide full access to complete functionality of the combiner.

Pins are located at the back side of the enclosure and distributed in a way, which allows to implement a mechanical reverse lock.

Prerequisites for such integration are a microcontroller mainboard supporting UART communication, 9V (or QC2.0 or QC3.0 compliant) power supply and 4 TTL channels for individual on/off modulation (or fast PWM power control) of each laser diode.

Combiner Pin-out Explained



- **L0** on/off diode TTL, 5V tollerant
- **L1** on/off diode TTL, 5V tollerant
- **GND** ground connected to the laser body
- **L2** on/off diode TTL, 5V tollerant
- **L3** on/off diode TTL, 5V tollerant
- **GND** ground connected to the laser body
- **Prog.** pin needs to be programmed to set 9V voltage, if a QC3 or QC2 compliant USB power supply is used. Another use of this pin is to control fan of a heatsink, based on laser body temperature.
- **Rx** UART communication, 5V tolerant
- **Tx** UART communication, 5V tolerant
- **Vcc** 9V or QC3.0 compliant power supply.**

** for communication with QC3.0 compliant power supply, the programmable pin needs to be configured for communication with the power supply.

Software Interface

The MatchBox laser control software is used for checking preset parameters, such as the max. laser diode current, target temperatures for TEC1 and TEC2 and actual measured values of these parameters, as well as the **load percentage of the Peltier elements**.



This is very helpful for laser diode age tracking and other troubleshooting actions. Also the software indicates if the laser is working in **ACC** (Automatic Current Control) or **APC** (Automatic Power Control) mode.

Device information shows key information about a laser, which is connected. Firmware, serial number, product code, operational hours and turn-on counter. In the software, it is possible to set if the laser should auto-start once connected to a power supply.

Heatsinks



A small footprint aluminum adapter to a standard M6 breadboard. It uses low profile M6 screws, thus the height profile is just 4 mm.

A water-cooled adapter to standard M6 breadboard. Used for achieving top stability and dissipating large amount of heat.

A low profile forced air cooler has an integrated centrifugal fan. Very efficient for dissipation of large amount of excess heat.



A cost-efficient high-capacity forced air-cooler. It is used mainly for DPSS lasers.

Advantages

- Easy to integrate (smallest enclosure on the market)
- Convenient to arrange in the proximity of a working area (use of fiber pigtails is often not necessary)
- Standard Package (MatchBox Series)
- User-friendly software with multiple parameter control and monitoring
- Low power consumption in standby-mode (important for battery-powered applications)
- Excellent beam pointing angle and beam position accuracy
- High cooling capacity for large operational temperature window
- Rugged enclosure
- Operational hours counter
- On/Off cycle counter
- Smart over-heat protection
- USB power
- Variety of accessories
- Space saving pinhead connector